

A New Species of Aplacophorous Mollusk

From the Southeastern Pacific Ocean:

Chaetoderma araucanae spec. nov.

(Mollusca : Caudofoveata : Chaetodermatidae)

BY

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(5 Text figures)

INTRODUCTION

APLACOPHOROUS MOLLUSKS have been recently separated into two independent classes, the Caudofoveata and the Solenogastres (SALVINI-PLAWEN, 1968). To date, only three species of these unusual mollusks have been recorded from the Chilean coast.

Scutopus chilensis Salvini-Plawen, 1972 (Caudofoveata, Limifossiridae) was described from off Valparaiso Bay, Taitao Peninsula and the Strait of Magellan by SALVINI-PLAWEN (1972). *Proneomenia gerlachei* Pelseneer, 1898; and *Pruvotina cryophila* (Pelseneer, 1898) (Solenogastres, Proneomeniidae) were described from the Chilean Antarctic by PELSENEER (1903).

Chaetoderma araucanae Osorio & Tarifeño, spec. nov. is the second species of Caudofoveata recorded from the Southeastern Pacific Ocean. Eighteen specimens were dredged by the R/V *Explorador* of the Department of Oceanology, University of Chile, Valparaiso, during June 1964, in the course of a dredging program designed to study the benthic communities in Valparaiso Bay, Chile (RAMORINO, 1968). All specimens belong to a single species.

Radula shape and morphology of body spicules were used as primary characteristics in the identification. The following taxon is proposed:

ACULIFERA Hatschek, 1891

CAUDOFOVEATA Boettger, 1955

CHAETODERMATIDAE Simroth, 1896

Chaetoderma Lovén, 1844

Chaetoderma araucanae Osorio & Tarifeño, spec. nov.

DESCRIPTION

Body: Worm-like, slender and covered by a layer of calcareous spicules (evidenced by the silvery shine they impart to the body surface). As is characteristic of the family Chaetodermatidae, *Chaetoderma araucanae* lacks a pedal groove. Overall length is 5 - 21 mm. The body (Figure 1) is clearly divided into a prothorax, a metathorax, and an abdomen, as is the case in *Ch. pacificum* (Schwabl, 1963).

The prothorax is strongly swollen, constitutes about 1/7 of the total length, and has a conspicuous oral ring and buccal plate at its anterior end.

The metathorax is short, forming an annular constriction between the prothorax and abdomen. It corresponds with the origin of the ring of retractor muscles (HYMAN, 1967).

The abdomen can be subdivided into a preabdomen (long and thin), a swollen postabdomen carrying the

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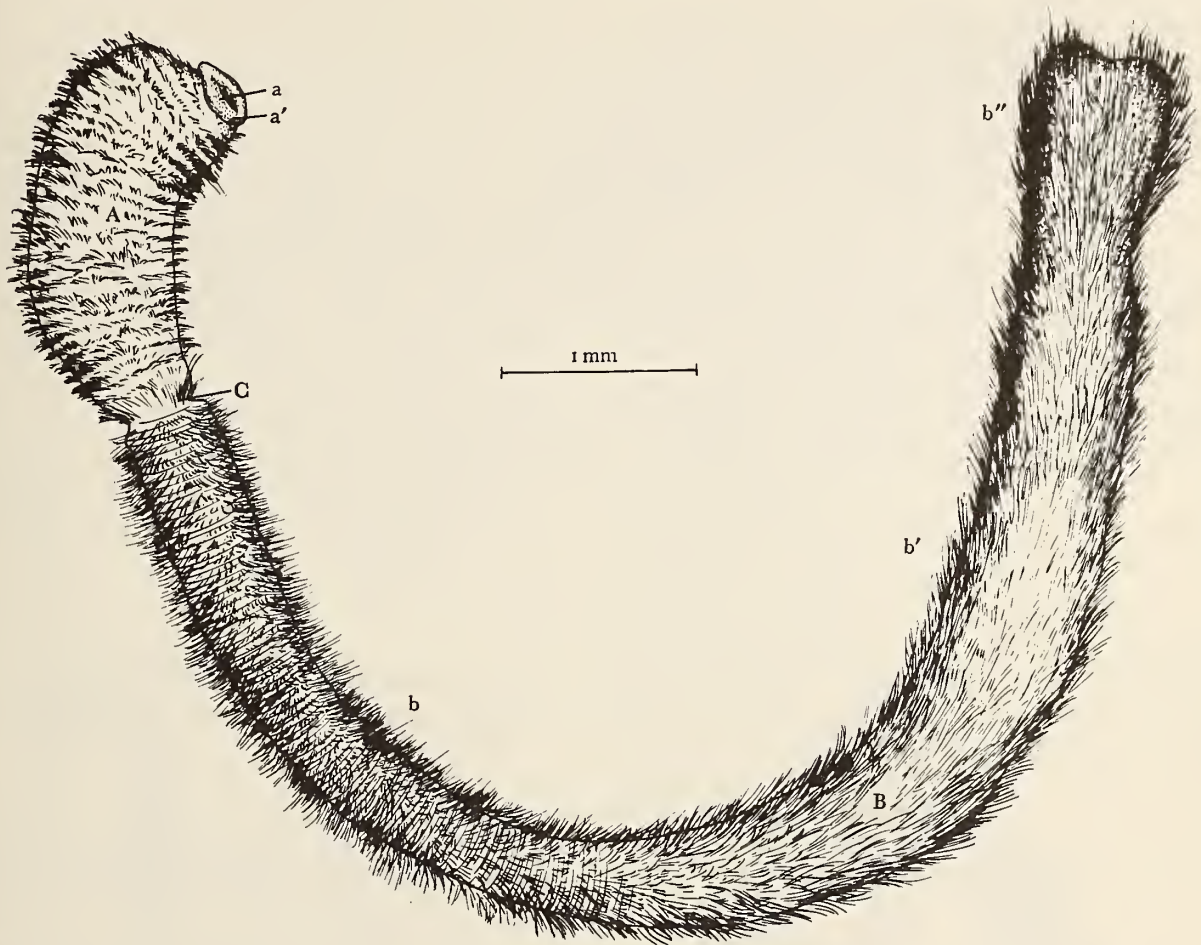


Figure 1

Chaetoderma araucanae Osorio & Tarifeño, spec. nov.

External features of the body

- | | | |
|---------------|--------------------|------------------|
| A - prothorax | a - mouth | a' - oral ring |
| B - abdomen | b - proabdomen | b' - postabdomen |
| | b'' - anal chamber | C - metathorax |

single gonad, and the anal chamber (delimited from the postabdomen by a muscular constriction).

Two ctenidial gills are inside the anal chamber. These were longitudinally oriented. In one specimen they were projecting to the exterior (Figure 2). The ctenidial gills are formed by 23 lamellae and are inserted on the inner face of the muscular constriction that delimits the anal chamber from the postabdomen.

Radula: The radula is located inside the foregut in the first third of the prothorax. As described for the genus (HYMAN, 1967; SALVINI-PLAWEN, 1969), the radular system of *Chaetoderma araucanae* is formed by a cone-shaped median tooth of 280 μm length; a dome-shaped membrane depressed somewhat at the summit and strongly thickened laterally, about 170 μm in length; 2 thin lateral projections of 50 μm length attached to the distal

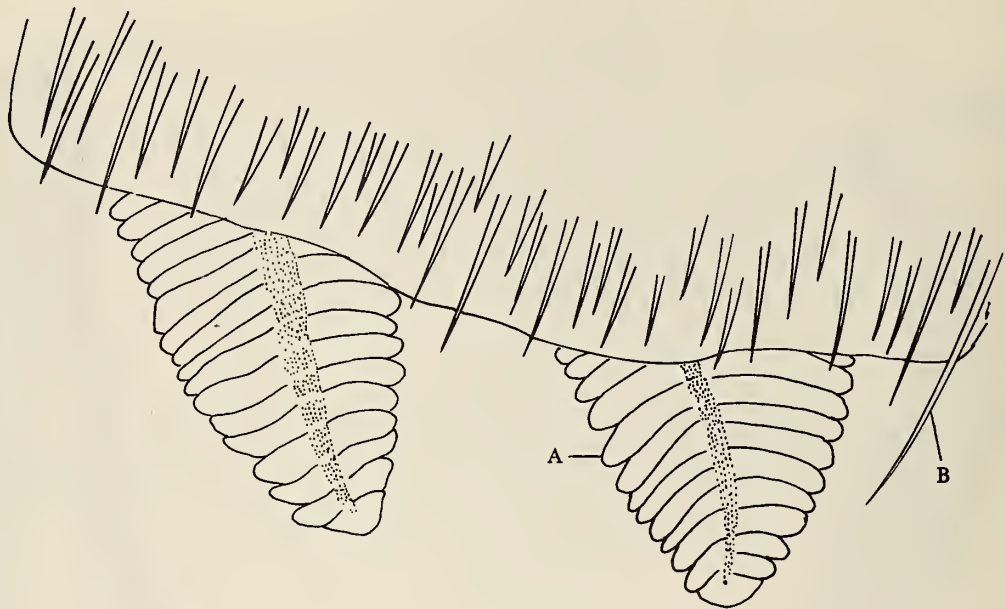


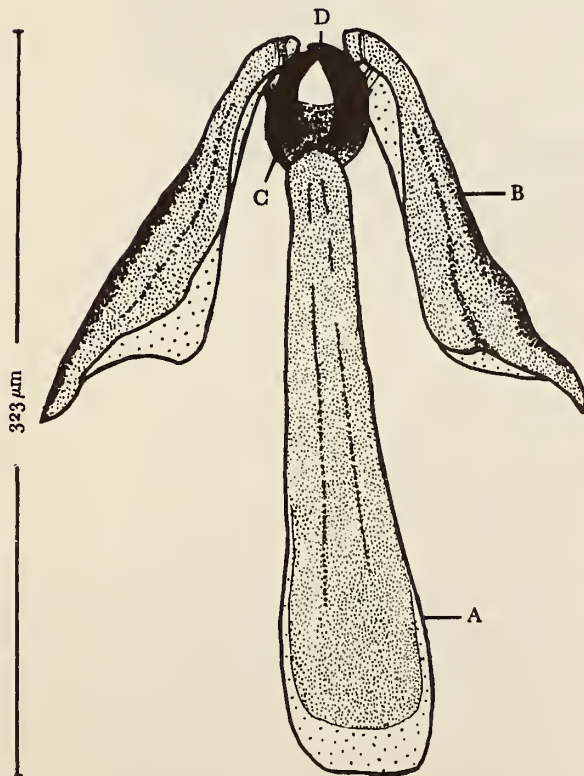
Figure 2

Chaetoderma araucanae Osorio & Tarifeño, spec. nov.

Tentacular gills projected to the exterior of the anal chamber

A - lamellae

B - spicules



end of the median tooth and to the dome-shaped membrane; and 2 nail-like denticles supported by the lateral projections (Figure 3).

This type of radula is similar to that of *Chaetoderma nitidulum* (KOWALESKY, 1901; SCHELTEMA, 1972). However, it differs from that species in having larger denticles in comparison with the size of both the median tooth and the dome-shaped membrane.

The cone-shaped teeth of the Chaetodermatidae have been interpreted as a fused radula continuously secreted at the basal end, with no loss at the distal end (SCHELTEMA, 1972).

(← adjacent column)

Figure 3

Chaetoderma araucanae Osorio & Tarifeño, spec. nov.

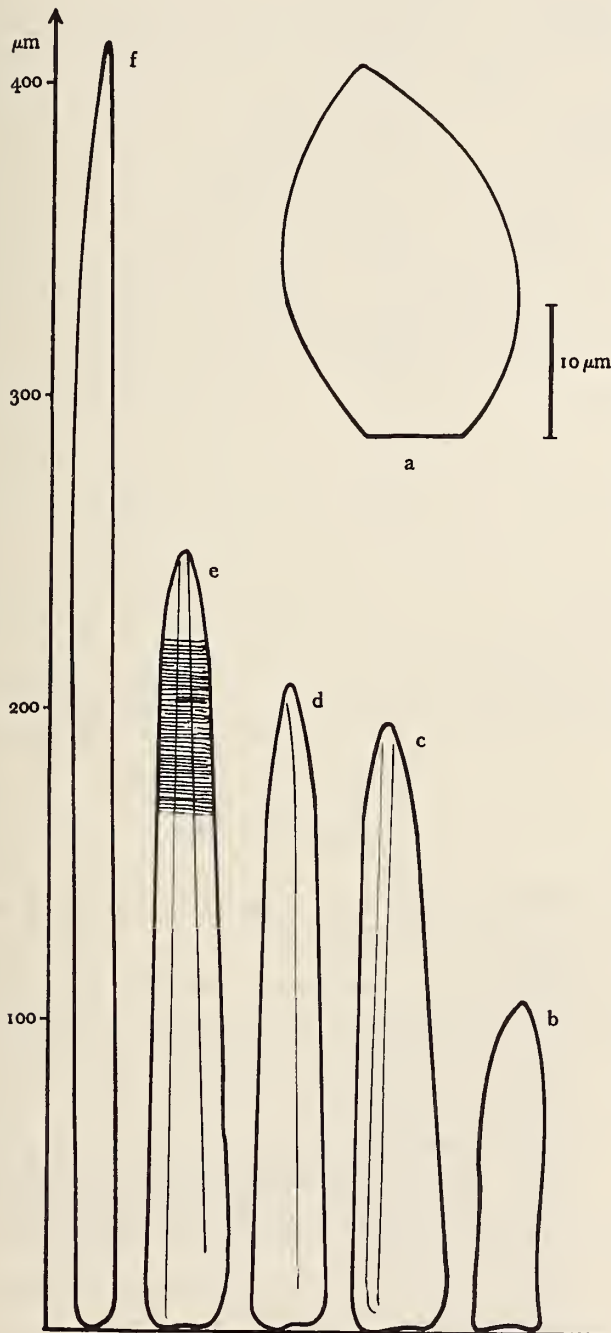
Radular system

A - cone-shaped median tooth

B - dome-shaped membrane

C - lateral projections

D - denticles



In accord with the terminology used by SCHELTEMA (1972) the "main tooth," "accessory teeth" and "lateral support" mentioned by HYMAN (1967), and the "Cuticular Basis," "Radula Zähne" and "Radula Tasche" described by SALVINI-PLAWEN (1969, 1972) correspond respectively to cone-shaped median tooth, denticles and dome-shaped membrane.

The Spicules: Spicules are very abundant on the body surface, giving the animals a silvery-shiny look. The spicules can be classified into 4 different types (Figure 4):

a) Small: ovoid-shaped, placed near the oral ring and measuring between $20\ \mu\text{m}$ and $30\ \mu\text{m}$ in length. Their shape is similar to type "a" spicules described for both *Chaetoderma pacificum* and *Ch. riedli* by SCHWABL (1963), but in *Ch. araucanae* they are different in having mostly rounded tips.

b) Medium: bullet-shaped, $100\ \mu\text{m}$ in length and localized on the prothorax.

c) Large: needle-shaped, with straight or concave basis, the size varying between $120\ \mu\text{m}$ and $400\ \mu\text{m}$ in length. They are found on the abdomen and the anal chamber. Some of them show transverse or longitudinal grooves.

d) Large: similar to needle-shaped spicules, but with subterminal or terminal expansions; placed only on the anal chamber. (Figure 5).

Another anatomical characteristic is the rounded buccal plate located in the center of the oral ring.

DIFFERENTIAL DIAGNOSIS

Chaetoderma araucanae differs from other species of *Chaetoderma* from the Eastern Pacific Ocean [such as *Ch. pacificum* (Schwabl, 1963); *Ch. riedli* Schwabl, 1963; and *Ch. rubrum* Schwabl, 1963] in having larger denticles, in having smaller type "c" spicules, in having rounded tipped type "a" spicules, in having spicules with subterminal or terminal expansions, and in having a remarkably swollen prothorax.

(← adjacent column)

Figure 4

Chaetoderma araucanae Osorio & Tarifeño, spec. nov.

Spicules: a - small, placed near the oral ring; b - medium, localized on the prothorax; c - f - large, found on the abdomen and anal chamber



Figure 5

Chaetoderma araucanae Osorio & Tarifeño, spec. nov.

Large spicules with subterminal or terminal expansions. They are found only on the anal chamber

Holotype: Holotype and paratype specimens have been deposited in the Chilean National Museum of Natural History Type Collection, Nos. 90001, 90002, and 90003. The dimensions of all animals collected are indicated in Table 1.

Type Locality: *Chaetoderma araucanae* was found at 119 - 145m depth in Valparaiso Bay, Chile (Lat. 33°02' S. Long. 71°38'W). Further details of the collected samples are given in Table 2.

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Table 1
Chaetoderma araucanae
 Dimensions of all specimens collected in Valparaiso Bay, Chile

Specimen no.	Length of body (mm)	Length of prothorax (mm)	Diameter of prothorax (mm)	Maximum diameter of abdomen (mm)
1	11.3	—	1.0	0.8
2	13.4	—	0.9	0.9
3	11.4	—	1.1	0.9
4	5.5	—	0.9	0.8
5	16.8	—	1.0	1.0
6	13.5	—	0.8	0.8
7	18.7	—	1.2	1.2
8	12.9	—	0.8	1.0
9	12.0	2.0	0.7	0.7
10	14.5	—	0.9	0.8
11	9.3	1.3	1.0	1.0
12	10.1	1.8	0.5	0.4
13 ²	10.3	1.7	0.7	0.7
14	20.7	1.7	1.2	1.0
15 ³	10.8	1.9	0.8	0.9
16 ³	11.4	2.1	1.3	0.9
17 ⁴	—	—	—	—
18 ⁴	—	—	—	—

² Holotype specimen

³ Paratype specimens

⁴ Animals used for histological studies

Table 2
Chaetoderma araucanae
 Details of the collected samples in Valparaiso Bay, Chile⁵

Transect	Station no.	Sample no.	Depth (m)	Lat. °S	Long. °W	Substratum
I	5	51	119	32° 56' 5"	71° 38' 6"	Sandy mud
I	7	56	134	32° 56' 5"	71° 41' 0"	Sandy mud
I	8	57	145	32° 56' 5"	71° 42' 2"	Muddy sand
I	8	58	144	32° 56' 5"	71° 42' 2"	Muddy sand

⁵ After RAMORINO (1968)